

REMARKS

At the outset, Applicants thank the Examiner for the thorough review and consideration of the subject application. The Non-Final Office Action of March 8, 2004, has been received and its contents carefully reviewed. Applicants appreciate the Examiner's withdrawing finality of Office Action dated February 9, 2004.

In the Non-Final Office Action dated March 8, 2004, the Examiner rejected claims 3, 4, 16-21, and 31 under 35 U.S.C. § 102(e) as being anticipated by Shiraki et al. (U.S. Pat. No. 6,504,522); rejected claims 5, 13-15, 32, and 33 under 35 U.S.C. § 102(e) as being anticipated by Matsuura et al. (U.S. Pat. No. 6,175,351); rejected claims 23, 24, and 27-30 under 35 U.S.C. § 103(a) as being unpatentable over Shiraki et al. in view of Lee (U.S. Pat. No. 6,064,459); rejected claims 25 and 26 under 35 U.S.C. § 103(a) as being unpatentable over Matsuura et al. in view of Lee; and rejected claims 6, 22, 34, and 35 under 35 U.S.C. § 103(a) as being unpatentable over Shiraki et al. in view of Matsuura et al. Applicants respectfully traverse these rejections in view of the following remarks.

The rejection of claims 3, 4, 16-21, and 31 under 35 U.S.C. § 102(e) as being anticipated by Shiraki et al. is respectfully traversed and reconsideration is hereby requested.

Claim 3 is allowable over Shiraki et al. in that claim 3 recites a combination of elements including, for example, "supplying data signals to the signal wires having a width enlarged in accordance with a distance from a source of the scanning signal to the signal wires, wherein an accurate data signal is applied to each of the plurality of liquid crystal cells such that a picture displayed on the liquid crystal panel is not distorted." Shiraki et al. fails to teach, either expressly or inherently, at least this feature of the claimed invention.

Claim 4 is allowable over Shiraki et al. in that claim 4 recites a combination of elements including, for example, "allowing the data signals to be supplied to the signal wires to have a different width in accordance with a distance from a source of the scanning wire, wherein an accurate data signal is applied to each of the plurality of liquid crystal cells such that a picture displayed on the liquid crystal panel is not distorted." Shiraki et al. fails to teach, either expressly or inherently, at least this feature of the claimed invention.

Claim 16 is allowable over Shiraki et al. in that claim 16 recites a combination of elements including, for example, “signal side driving means for supplying data signals having a width enlarged in accordance with a distance from a source on the scanning wire to the signal wires, wherein an accurate data signal is applied to each of the plurality of liquid crystal cells such that a picture displayed on the liquid crystal panel is not distorted.” Shiraki et al. fails to teach, either expressly or inherently, at least this feature of the claimed invention. Accordingly, Applicants respectfully submit that claims 17 and 18, which depend from claim 16, are also allowable over the cited references.

Claim 19 is allowable over Shiraki et al. in that claim 19 recites a combination of elements including, for example, “width control means for making the data signals to be supplied to the signal wires have a different width in accordance with a distance from a source on the scanning wire, wherein an accurate data signal is applied to each of the plurality of liquid crystal cells such that a picture displayed on the liquid crystal panel is not distorted.” Shiraki et al. fails to teach, either expressly or inherently, at least this feature of the claimed invention. Accordingly, Applicants respectfully submit that claims 20 and 21, which depend from claim 19, are also allowable over the cited references.

Claim 31 is allowable over Shiraki et al. in that claim 31 recites a combination of elements including, for example, “wherein the data signals have varying widths depending on a distance of the data lines from the scanning signal sources, wherein an accurate data signal is applied to each of the plurality of liquid crystal cells such that a picture displayed on the liquid crystal panel is not distorted.” Shiraki et al. fails to teach, either expressly or inherently, at least this feature of the claimed invention.

The rejection of claims 5, 13-15, 32, and 33 under 35 U.S.C. § 102(e) as being anticipated by Matsuura et al. is respectfully traversed and reconsideration is requested.

Claim 5 is allowable over Matsuura et al. in that claim 5 recites a combination of elements including, for example, “supplying a scanning signal having a width reduced in accordance with an increased distance from a source of the signal wire to the scanning wire.” Matsuura et al. fails to teach, either expressly or inherently, at least this feature of the claimed invention.

Claim 13 is allowable over Matsuura et al. in that claim 13 recites a combination of elements including, for example, “width control means for allowing the scanning signal to have a width reduced in accordance with an increased distance from a source of the signal wire.” Matsuura et al. fails to teach, either expressly or inherently, at least this feature of the claimed invention.

Claim 32 is allowable over Matsuura et al. in that claim 32 recites a combination of elements including, for example, “wherein the scanning signal has a reduced width in proportion to an increased distance of the scanning lines from the scanning signal sources.” Matsuura et al. fails to teach, either expressly or inherently, at least this feature of the claimed invention.

Claim 33 is allowable over Matsuura et al. in that claim 33 recites a combination of elements including, for example, “wherein the scanning signal has a reduced width in proportion to an increased distance of the scanning lines from the data signal sources.” Matsuura et al. fails to teach, either expressly or inherently, at least this feature of the claimed invention.

The rejection of claims 23, 24, and 27-30 under 35 U.S.C. § 103(a) as being unpatentable over Shiraki et al. in view of Lee is respectfully traversed and reconsideration is requested.

Claim 23 is allowable over Shiraki et al. in view of Lee in that claim 23 recites a combination of elements including, for example, “a plurality of scanning driver integrated circuits... a plurality of data driver integrated circuits.... and a width controller....” Neither Shiraki et al. nor Lee, singly or in combination, teach or suggest at least these features of the claimed invention. Applicants respectfully submit that claim 24 which depends from claim 23, is also allowable over Shiraki et al. in view of Lee.

Claim 29 is allowable over Shiraki et al. in view of Lee in that claim 29 recites a combination of elements including, for example, “applying data line signals from a plurality of data driver integrated circuits (ICs) to the data lines of the LCD, each data line being connected at one end to one of the data driver ICs; and applying scanning line signals to each of the scanning lines, a first width of a first one of the scanning line signals applied to a first one of the scanning lines located a first distance from the data driver ICs being different from a second width of a second one of the scanning line signals applied to a second one of the scanning lines

located a second distance from the data driver ICs, wherein the first distance is greater than the second distance.” Neither Shiraki et al. nor Lee, singly or in combination, teach or suggest at least these features of the claimed invention. Applicants respectfully submit that claim 30, which depends from claim 29, is also allowable over Shiraki et al. in view of Lee.

Regarding the rejection of claims 23 and 29, the Examiner states Shiraki et al. teaches “all of the claimed limitations, except for ‘a plurality of scanning driver integrated circuit, a plurality of data driver integrated circuits’,” and cites Lee as teaching “TFT-LCD having a plurality of data line driver integrated circuit packages 40, and a plurality of gate driver IC package 60 (see figure 1, col. 1, lines 23-28).” In concluding the rejection, the Examiner states it would have been obvious to “...utilize a plurality of gate driver IC and a plurality of data driver IC taught by Lee for the TFT-LCD driver circuit system disclosed by Shiraki et al because this would provide less image distortion due to cross talk between elements of the display (see col. 2, lines 35-36 of Lee).” Applicants respectfully disagree.

Assuming *arguendo* that Lee teaches “a plurality of data line driver integrated circuit packages 40, and a plurality of gate driver IC package 60,” the Examiner has improperly attributed a reduced “image distortion due to cross talk between elements of the display” as the result of utilizing “a plurality of gate driver IC and a plurality of data driver IC taught by Lee.” For example, Lee states at column 1, lines 61-65 “This distortion may be attributed to a distortion of the common electrode voltage on the common electrode layer 9 with respect to the other control signals applied to the LCD 5, e.g., the data signals applied to individual LCD elements.” At column 4, lines 31-44, Lee states that such distortion can be reduced because “[e]ach bonding substrate 70 also has first and second common electrode drivers 74a, 74b mounted thereon. A respective one of the first and second common electrode drivers 74a, 74b is electrically connected to a respective one of the first and second common electrode conductors 51a, 51b. ...As a respective one of the common electrode regions 11a, 11b is separately driven by a respective one of the common electrode drivers 74a, 74b, a more uniform common electrode potential can be produced on the common electrode regions 11.”

Accordingly, Applicants respectfully submit it would not be obvious combine Lee with Shiraki et al. at least because there is no evidence that a reduced image distortion, due to cross

talk between elements of the display of Shiraki et al., would result simply by providing a plurality of gate and driver ICs, as asserted by the Examiner. Absent any objective evidence, either in the references themselves or in the knowledge generally available to those skill in the art, Applicants respectfully submit Shiraki et al. has been combined with Lee using the presently claimed invention as a template, via impermissible hindsight.

In the “Response to Arguments” section of the present Office Action, the Examiner attempts to rebut the above-established showing of hindsight by stating that “it would have been obvious to... modify a plurality of gate... and data driver IC reviewed by Lee for Shiraki’s column and row driver circuits are well known and expected in the art because this is known to provide less image distortion due to cross talk between elements of the display (see col. 2, lines 35-36 of Lee). Applicants respectfully disagree.

It is respectfully submitted that column 2, lines 35-36 of Lee state “[it is an object of the present invention to provide LCDs and] methods of operation thereof which can provide less image distortion due to cross talk between elements of the display.” Thus the preceding citation to Lee fails to provide any evidence that use of a plurality of gate and driver ICs “are well known and expected... to provide less image distortion due to cross talk between elements of the display,” as asserted by the Examiner. Moreover, Applicants respectfully submit that the “distortion due to cross talk,” of which the inventive concept of Lee is directed to “provide less of,” is present in the display 5 illustrated in Figure 1 of Lee. Referring to Figure 1 of Lee, it is readily seen that the display 5 appears to include a plurality of data and gate driver ICs 40 and 60, respectively. Accordingly, and contrary to the Examiner’s assertion, Applicants respectfully submit that it is not “well known and expected” that use of a plurality of data and gate driver ICs “provide less image distortion due to cross talk between elements of the display,” as asserted by the Examiner.

Claim 27 is allowable over Shiraki et al. in view of Lee in that claim 27 recites a combination of elements including, for example, “applying data line signals to each of the data lines, a first width of a first one of the data line signals applied to a first one of the data lines located a first distance from the scanning driver IC being greater than a second width of a second one of the data line signals applied to a second one of the data lines located a second distance

from the scanning driver IC, wherein the first distance is greater than the second distance, wherein an accurate data signal is applied to each of the plurality of liquid crystal cells such that a picture displayed on the liquid crystal panel is not distorted.” Neither Shiraki et al. nor Lee, singly or in combination, teach or suggest at least these features of the claimed invention. Accordingly, Applicants respectfully submit that claim 28, which depends from claim 27, is also allowable over Shiraki et al. in view of Lee.

Regarding the rejection of claim 27, the Examiner states Shiraki et al. teach “all of the claimed limitations, except for ‘a plurality of scanning driver integrated circuit, a plurality of data driver integrated circuits.’”

For similar reasons discussed above with respect to the rejections of claims 3, 4, 16, 19, and 31, Applicants respectfully submit Shiraki et al. fails to teach or suggest at least the aforementioned combination of elements with respect to claim 27, “except for ‘a plurality of scanning driver integrated circuit, a plurality of data driver integrated circuits,’” as asserted by the Examiner.

Further, Applicants respectfully submit claim 27 requires neither the “plurality of scanning driver integrated circuit[s]” nor the “plurality of data driver integrated circuit[s],” as asserted by the Examiner. Accordingly, Applicants respectfully submit there is no motivation to combine Shiraki et al. with Lee and arrive at the invention defined by claim 27.

The rejection of claims 25 and 26 under 35 U.S.C. § 103(a) as being unpatentable over Matsuura et al. in view of Lee is respectfully traversed and reconsideration is requested.

Claim 25 is allowable over Matsuura et al. in view of Lee in that claim 25 recites a combination of elements including, for example, “a plurality of scanning driver integrated circuits... a plurality of data driver integrated circuits... and a controller....” Neither Matsuura et al. nor Lee, singly or in combination, teach or suggest at least these features of the claimed invention. Accordingly, Applicants respectfully submit that claim 26, which depends from claim 25, is also allowable over Matsuura et al. in view of Lee.

In rejecting claim 25, the Examiner states Matsuura et al. teaches “all of the claimed limitations, except for ‘a plurality of scanning driver integrated circuit, a plurality of data driver

integrated circuits,” and cites Lee as teaching “TFT-LCD having a plurality of data line driver integrated circuit packages 40, and a plurality of gate driver IC package 60 (see figure 1, col. 1, lines 23-28).” In concluding the rejection, the Examiner states it would have been obvious to “...utilize a plurality of gate driver IC and a plurality of data driver IC taught by Lee for the TFT-LCD driver circuit system disclosed by Shiraki et al because this would provide less image distortion due to cross talk between elements of the display (see col. 2, lines 35-36 of Lee).” (Office Action at 11.)

For similar reasons discussed above with respect to the rejections of claims 23 and 29, Applicants respectfully submit there is no motivation or suggestion, either within the references themselves or within the knowledge generally available to one of ordinary skill in the art, to combine Matsuura et al. and Lee and arrive at the invention defined by claim 25.

The rejection of claims 6, 22, 34, and 35 under 35 U.S.C. § 103(a) as being unpatentable over Shiraki et al. in view of Matsuura et al. is respectfully traversed and reconsideration is requested.

Claim 6 is allowable over Shiraki et al. in view of Matsuura et al. in that claim 6 recites a combination of elements including, for example, “applying a scanning signal having a width varied in accordance with a position of the signal wire relative to the scanning wire; and supplying data signals having a width enlarged in accordance with a distance from a source of the scanning wire to the signal wires.” Neither Shiraki et al. nor Matsuura et al., singly or in combination, teach or suggest at least these features of the claimed invention.

Claim 22 is allowable over Shiraki et al. in view of Matsuura et al. in that claim 22 recites a combination of elements including, for example, “scanning side driving means for applying a scanning signal voltage having a width enlarged in accordance with a distance from a source of the signal wire to the scanning wire; and signal side driving means for supplying a data signal voltage having a width enlarged in accordance with a distance from a source of the scanning wire to the signal wire.” Neither Shiraki et al. nor Matsuura et al., singly or in combination, teach or suggest at least these features of the claimed invention.

Claim 34 is allowable over Shiraki et al. in view of Matsuura et al. in that claim 34 recites a combination of elements including, for example, “a plurality of data drivers; a plurality of gate drivers; and a plurality of width expanders for controlling widths of data signals provided to the data lines in accordance with a distance from the data lines to the scanning signal sources; wherein a scanning signal voltage has a varying width depending on the distance of the scanning lines from the data signal sources.” Neither Shiraki et al. nor Matsuura et al., singly or in combination, teach or suggest at least these features of the claimed invention.

Claim 35 is allowable over Shiraki et al. in view of Matsuura et al. in that claim 35 recites a combination of elements including, for example, “a plurality of data drivers; a plurality of gate drivers; and a plurality of width expanders for controlling widths of a scanning signal provided to the scanning lines in accordance with a position of the scanning lines relative to the data signal sources; wherein a plurality of data signal voltages have varying widths depending on the distance of the data lines from the scanning signal sources” Neither Shiraki et al. nor Matsuura et al., singly or in combination, teach or suggest at least these features of the claimed invention.

In rejecting claims 6, 22, 34, and 35, the Examiner correctly cites Shiraki et al. failing to teach “supplying scanning [signal] having a width enlarged in accordance with a position of the signal wire relative to the scanning wire.” Attempting to cure the deficiency of Shiraki et al., the Examiner relies upon Matsuura et al. as teaching “outputting the scanning signal voltages... having a width enlarged... in accordance with a distance from a data driver... of the signal wires.” The Examiner then concludes it would have been obvious to “provide outputting the scanning signal voltages (P1, P2, P3, fig. 14) having a width enlarged ($t_1 < t_2 < t_3$, fig. 14) in accordance with a distance from a data driver (60, fig. 12) of the signal wires taught by Matsuura et al to Shiraki’s row driver because this would minimize the variation in luminance and the flickering, prevent in brightness due to the reduction of the effective display time, and thus the quality is significantly improved (see col. 23, lines 26-30 of Matsuura et al.).” Applicants respectfully disagree.

The above-cited concept of Matsuura et al. is directed to minimizing the variation in luminance, flickering, and decrease in brightness to a reduced effective display time in a display

Application No.: 09/327,282
Amendment dated August 9, 2004
Reply to non-final Office Action dated March 8, 2004

Docket No.: 8733.086.00-US

driven according to a field sequential scanning method (see Matsuura et al., column 1, lines 53-54; column 4, lines 11-27; column 6, lines 46-50; and column 22, line 38 - column 23, line 31). However, the device of Shiraki et al. is not driven according to the same method as Matsuura et al. (compare, for example, Figure 7 of Shiraki et al. and Figure 14 of Matsuura et al.) As the scanning method that drives the device of Shiraki et al. is different from the scanning method that drives the device of Matsuura et al., Applicants respectfully submit modifying Shiraki et al. with Matsuura et al. would not "minimize the variation in luminance and the flickering, prevent in brightness due to the reduction of the effective display time" of Shiraki et al. as asserted by the Examiner. In this respect, Applicants respectfully submit that Shiraki et al. and Matsuura et al. are non-analogous art and are, therefore, not properly combinable references under 35 U.S.C. § 103(a).

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

If the Examiner deems that a telephone conversation would further the prosecution of this application, the Examiner is invited to call the undersigned at (202) 496-7500.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. A duplicate copy of this sheet is enclosed.

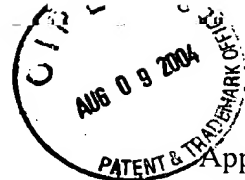
Dated: August 9, 2004

Respectfully submitted,



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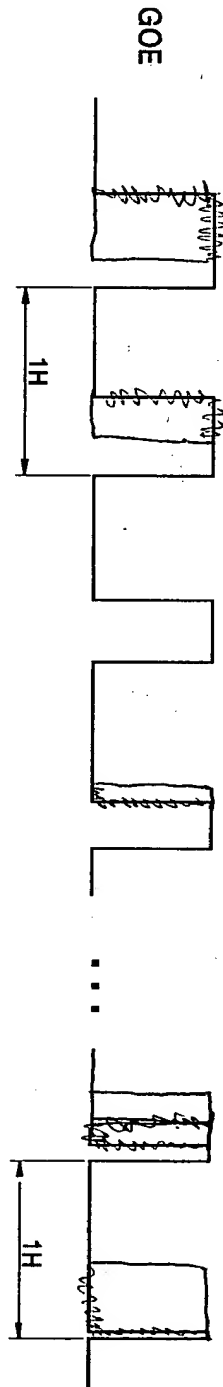


FIG. 19

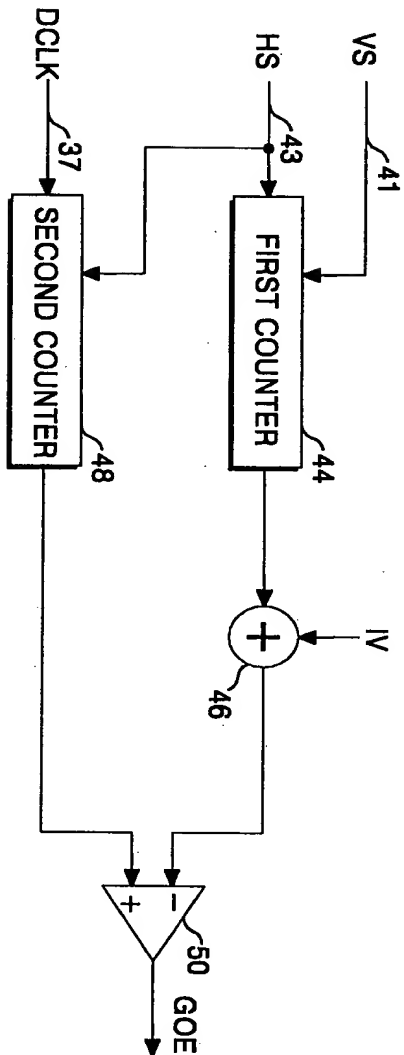


FIG. 29



App No.: 09/327,282
Inventor: Yun Cheol Jeong et al.
Title: METHOD OF DRIVING LIQUID CRYSTAL PANEL AND
APPARATUS THEREOF

Docket No.: 8733.086.00-US

ANNOTATED SHEET

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FIG. 20

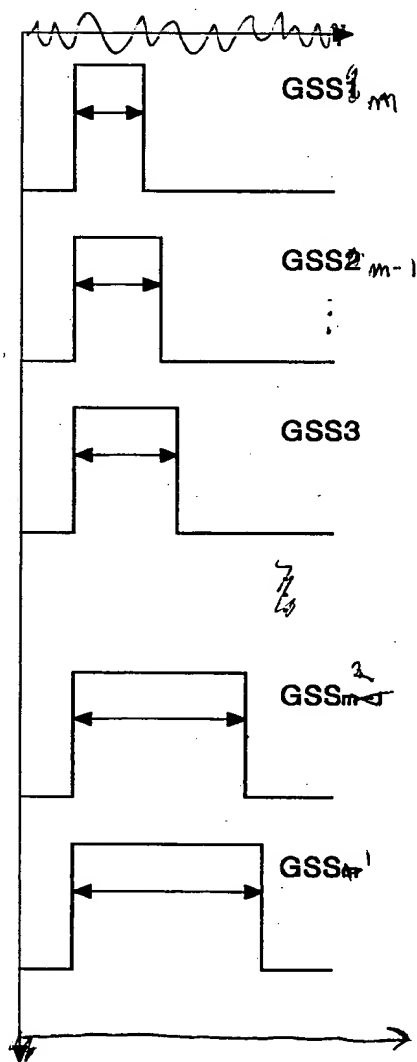


FIG. 21

